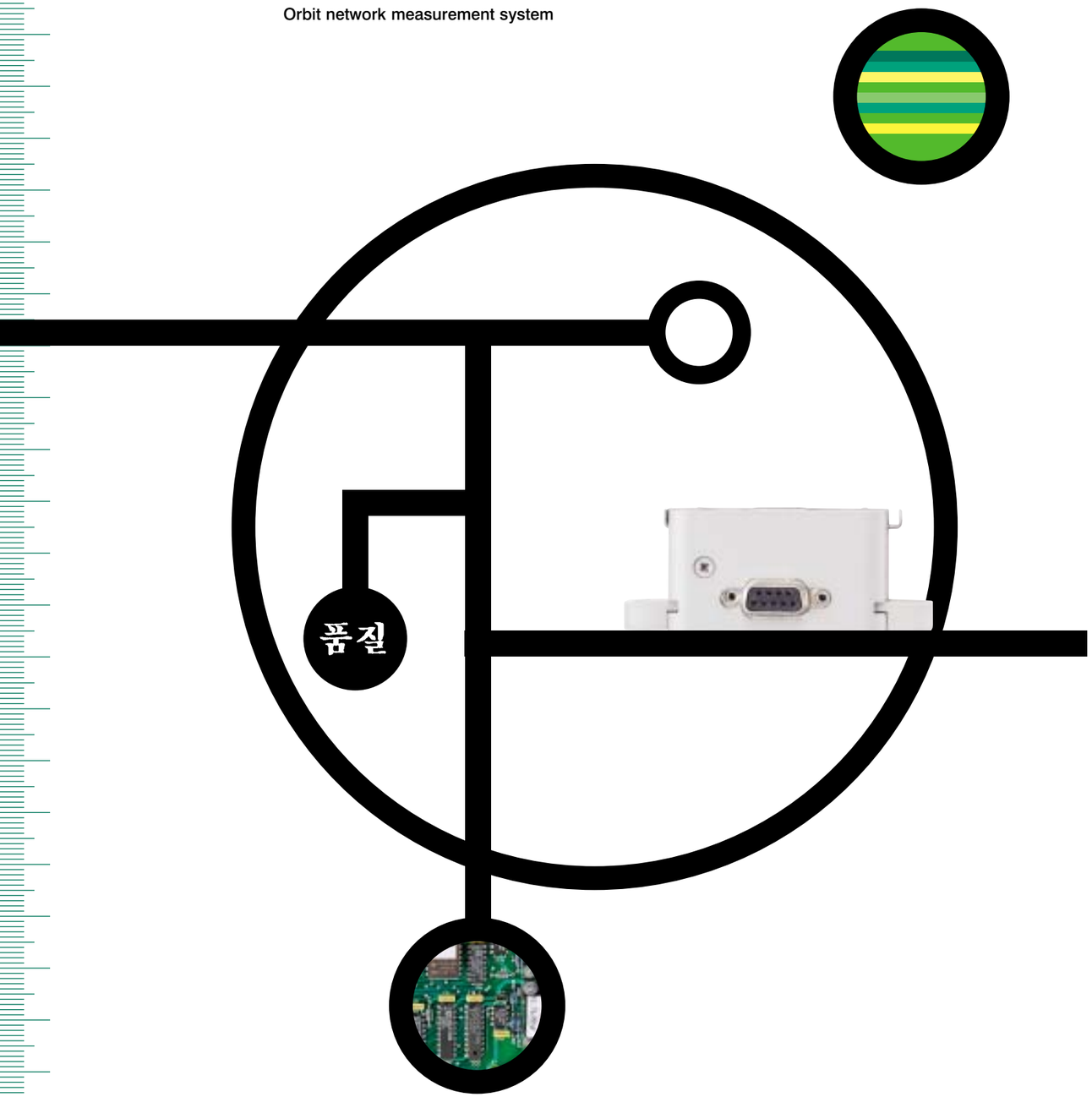
orbit

Orbit network measurement system



Orbit is Solartron's RS485 network with Plug and Go compatibility. Devices can be used in any combination in any position and each is automatically given a unique address. Connection can be made to:

1. A PC using the Orbit Network Card
2. A PC or PLC using the RS232 Interface Module.

Orbit Network Card

Output from the encoder's PIE connector can be linked to a PC through the Orbit Network Card fitted into the expansion slot. It will accept up to 62 Linear Encoders, Digital Probes or I/O modules. Up to 6 cards can be used together, giving a total capacity of 372 measuring points.

RS232 Interface Module

Devices in the Orbit network can be connected to the RS232 port on a PC or PLC using the RS232 Interface Module. Up to 31 probes can be connected to one RS232 module and multiple modules can be used in a system.

Software

Support software for Windows 95/98/NT, Windows 3.x and DOS is supplied with the Orbit Network Card and RS232 Interface Module.

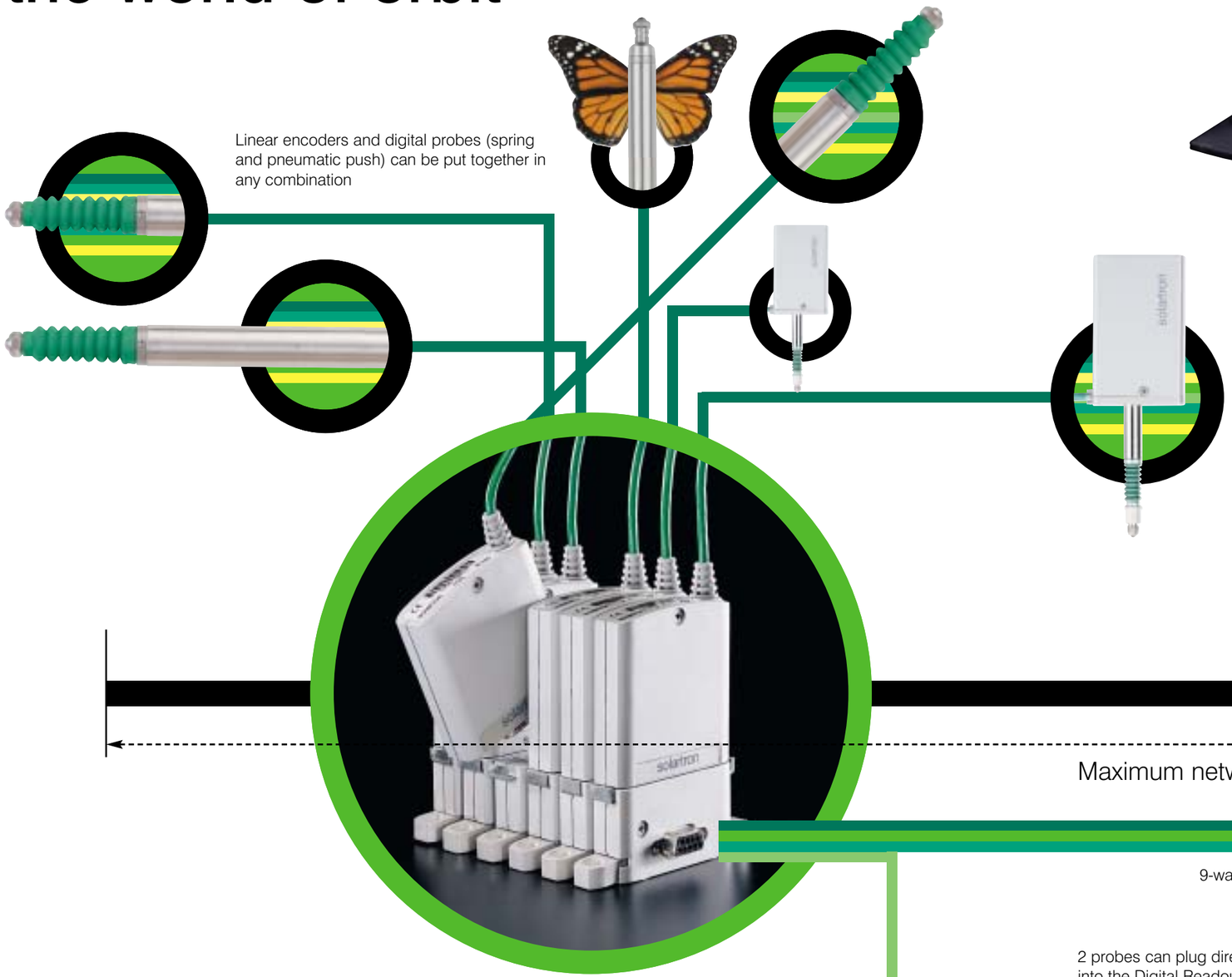
The Windows Support Software Disks include Dynamic Link Libraries (DLL's) for either 16 bit or 32 bit applications. The DLL's support applications written in C, Visual Basic and Delphi. Example programs for these languages are available on request. The DOS Software Support Disk includes DOS driver for C, Pascal and Quick Basic. Example programs with source code are also included as well a DOS demonstration program showing outputs in numerical and column display formats.

Systems Build

Orbit is a simple solution to building measurement systems without incurring the high costs normally associated with bespoke networks. The linear encoder PIE has a 'D-Type' connector - which slots neatly into the 'T-Con' connector. The 'T-Con' is an ingenious accessory that can be used individually, daisy chained using standard computer cable, or banked together in blocks to form a multi-channel nest.
A positive locking mechanism on the T-Con prevents the PIE connector being accidentally dislodged while allowing instant removal and replacement.

Orbit is a trademark of Solartron Group Ltd.

the world of orbit



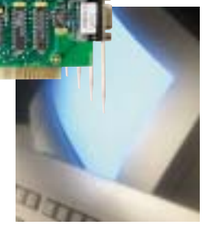
Linear encoders and digital probes (spring and pneumatic push) can be put together in any combination

PC/PLC RS232 comms port

Orbit PC network card

RS232 Interface Module and Power Supply Interface Module
(PSIM must be used with RS232 module or in large network configuration)

Up to 31 probes per RS232 Interface Module



Total capacity 372 probes (up to 6 Orbit cards per PC, 2 channels of 31 probes per card)

Up to 372 probes

Maximum network length 1km

9-way cable

Digital Input/ Output Module

2 probes can plug directly into the Digital Readout

Digital Readout

Up to 30 probes

What is Orbit?

Orbit is a simple and effective system for connecting Digital Probes, Linear Encoders and I/O modules to a PC or Solartron Digital Readout.

The Orbit Modules plug together using the T-Con connection system. Up to 31 modules can be connected to a single cable, which in turn connects to either an Orbit Network Controller (Orbit Network Card or Orbit RS232 Interface Module) or a Solartron Digital Readout. The Orbit Network Card plugs into a slot in a PC and the Orbit RS232 Interface Module can be connected to an RS232 port.

Orbit uses RS485 electrical signals to communicate with the Orbit Modules.

Using the Orbit commands, the Digital Readout, or the application program running on a PC, can send commands and receive responses (eg. get readings) from the modules on the Orbit Network.

What are the Main Advantages of Orbit?

- It is quick and easy to connect the Orbit system together, so you can be up and running in a short space of time.
- You can use both Digital Probes and Linear Encoders on a single Orbit Network, to suit your application.
- Only one cable is needed to connect up to 31 probes, removing the need for bulky and costly wiring harnesses.
- All the signal conditioning electronics are included in the Orbit Modules, so you don't need to provide it.
- The cable length can be up to 1 km so that you can locate your PC remotely from the gauging station (Additional power supplies may be required).
- We supply interfacing software for most popular programming languages eliminating the need for you to develop these yourself.

Do You Supply Software?

Yes. Our Orbit Excel Support Pack can put readings directly into cells in a Microsoft Excel Spreadsheet. All that you need to do is to configure your spreadsheet to perform the function you require.

If you want to write your own application program then you'll need our Windows or DOS support software. To get you up and running quickly, example programs for the popular programming languages can be supplied, which you can copy and paste into your application.

Support software for LabVIEW is also available.

I have an RS485 port on my computer. Can I connect Orbit directly to this?

We strongly recommend that you use one of our Orbit Controllers (Orbit Network Card or Orbit RS232 Interface Module) and our support software, rather than connecting at the RS485 level. The reasons for this are as follows:

The RS485 standard purely specifies the hardware to be used. There are numerous different RS485 protocols. Just because you have an RS485 port on your PC doesn't mean that you can communicate with Orbit. Orbit uses a proprietary protocol that has been developed to operate with Digital Probes and Linear Encoders. This protocol uses a special "break" character and some specific timing relationships that must be met. If you connect Orbit directly to your RS485 port it is unlikely that you will be able to satisfy all of these specific requirements. If you use our Orbit Network Controllers and support software you will not need to work at this low level, so you will save a lot of work writing, debugging and supporting your software and hardware.

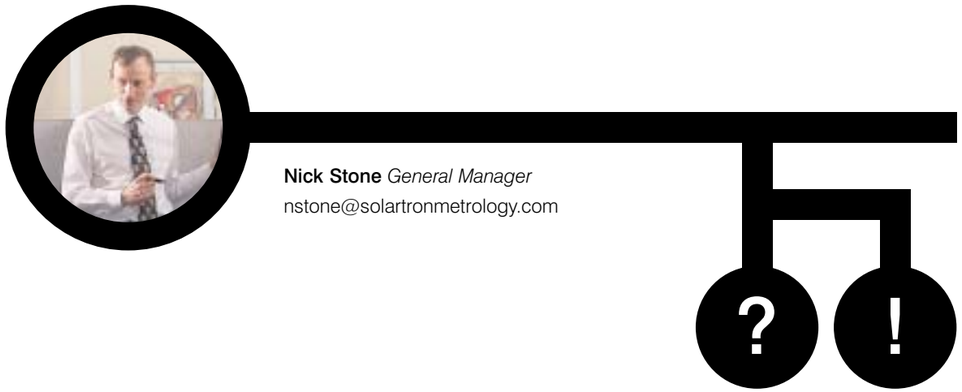
As we add new modules and features to the Orbit Network we update our Orbit support software and in special cases, our Orbit Controllers. This saves you from having to update, debug and support your own RS485 drivers and hardware.

How easy is it to interface Orbit with my SPC software?

There are a number of different SPC software packages that are used with gauging systems. These packages generally use the calculated results of the particular characteristics that are being measured (eg. squareness, parallelism etc.) rather than directly using the readings from the probes.

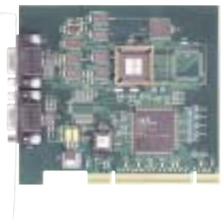
It is necessary to have some hardware and/or PC software performing this "gauging" function. A number of our customers provide gauging systems that use Digital Probes and Linear Encoders to interface with various SPC software packages. Details of these companies can be provided on request.

An alternative approach is to use a DR700, which is a stand-alone readout, that can be used in gauging systems. Up to 30 Digital Probes or Linear Encoders can be connected to the DR700 via the Orbit Network. The RS232 port on the DR700 transmits ASCII characters which are compatible with most SPC packages.



Nick Stone *General Manager*
nstone@solartronmetrology.com

Orbit PCI Network Card	*Kit Part No. 911232
Dimensions	32 bit short card (5 Volt)
Input / Output	Dual RS485 ports located at standard PC bracket output
RS485 data rate	187.5 Kbaud
Operating temperature (°C)	0-60
Max. length of network	Up to 1km dependent on network configuration
Power requirements	Orbit card plus 31 probes requires total 2A @ nominal 5V dc



Orbit ISA Network Card	*Kit Part No. 911153
Dimensions	Single slot width PC AT/XT card
Input / Output	Dual RS485 ports located at standard PC bracket output
RS485 data rate	187.5 Kbaud
Operating temperature (°C)	0-60
Max. length of network	Up to 1km dependent on network configuration
Power requirements	Orbit card plus 31 probes requires total 2A @ nominal 5V dc

*Network card kits consists of the following items: **Hardware:** Network Card, System/Installation manual, 1.5M data cable, Network terminator, Screw locks. **Software:** Orbit Windows 32 Bit applications Support Pack, DOS Support Pack.
Above parts can be purchased separately.

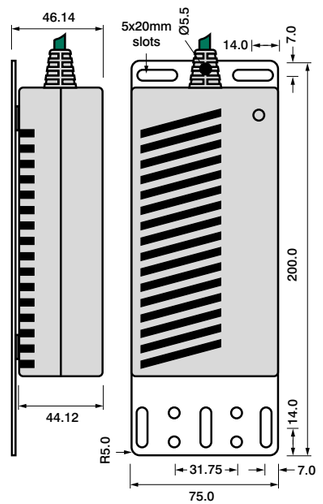
RS232 Interface Module	*Kit Part No. 911174
Must be used in conjunction with the power supply module	
Interface	RS232C or V24/V28
RS232 data rate	Up to 115.2 Kbaud
Operating temperature (°C)	0-60
Connector	9 way “D” type permanently attached to RS232 Interface Module with 1.5m cable
Power requirements	5Vdc @ 0.06A

*RS232 Interface Module kit consists of the following items: **Hardware:** RS232 Interface Module, User manual, Network terminator, Screw locks. **Software:** Orbit Windows 32 Bit applications Support Pack, DOS Support Pack.
Above parts can be purchased separately.

Digital Input/Output Module	Part No. 911221
The Digital Input/Output module (DIOM) enables the 'Orbit Network' to interface with the outside world. The module provides 8 general purpose input/output lines, housed in the standard Orbit Module case.	
Operating temperature(°C)	0-60
Connector	15 way "D" type permanently attached to DIOM with 0.5m cable
Input specification	-0.5V to +30V dc range Internal 4.7kΩ pull up resistor for monitoring logic outputs +5V dc CMOS compatible switching thresholds
Output specification	Open drain Drive load up to +30V dc 50mA each output continuous Internal 4.7kΩ pull up for driving logic +5V dc supply via DIOM for low power loads (50mA total max)

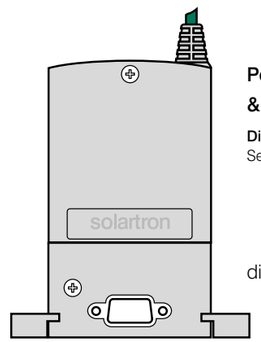
Happy Light	Part No. 971020

Connected on the last T-CON of the Orbit network the "happy light" plug will flash to indicate when the network is functioning. It is highly recommended as an additional item to the Orbit network. Nominal dimensions are 47mm x 31mm x 15mm.



Transformer

(Only for Power Supply Interface Module Versions PSIM - AC and PSIM - DC)



Power Supply Interface Module & RS232 Interface Module

Dimensions are as PIE plus T-CON
See page 31 (Module does not separate)

dimensions mm

Power Supply Interface Module
For use with multi-channel systems needing more power than available from the computer.
The power supply can also extend the network beyond the normal 10m per port limit up to 1Km.

Output voltage	5.1V dc @ 1.8A Max.
Operating Temp.	0-60 °C
Drive Capability	31 Orbit modules
Dimensions	see drawing
Version PSIM-AC	Part No. 911173
Supply Voltage	90V ac to 264V ac @ 1A max
Supply Frequency	47Hz to 440Hz
Termination	IEC 320 plug (supplied with 2m lead and local ac supply connector)
Length of cable	2m between module and power supply
Version PSIM-DC	Part No. 911225
Supply Voltage	10V dc to 30V dc
Termination	5m flying lead
Length of cable	2m between module and power supply
Version PSIM-5V	Part No. 911226
Supply Voltage	+5V dc (from regulated supply)
Termination	5m flying lead (input directly to the module, there is no transformer)

Orbit Excel support pack

Orbit Network into Excel
Read up to 31 probes
Active key and timed readings
Read from Digital probes and Linear Encoders
Easy connection to Orbit Network Windows 95, 98, NT & 2000 using Excel 97 and Excel 2000*

The Orbit Excel Support Pack enables the user to take readings from the Orbit Newtwork and place values into the cells of a Microsoft Excel spreadsheet.

Part No. 911224

* All Trade Marks acknowledged